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September 3, 2003
Amy Nguyen
Amy Nguyen, Legal Assistant



RESPONSE UNDER 37 CFR §1.111
Examining Group 1638
Patent Application
Docket No. CIB-T100XC1
Serial No. 09/685,403

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner : David H. Kruse
Art Unit : 1638
Applicants : Peter R. Beetham, Patricia L. Avissar, Keith A. Walker, Richard A. Metz
Serial No. : 09/685,403
Filed : October 10, 2000
Confirm. No. : 4644
For : Non-Transgenic Herbicide Resistant Plant

Drawing Review Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBMISSION OF FORMAL DRAWINGS

Sir:

Submitted herewith please find 14 sheets of formal drawings (Figs. 1-7). The Examiner is respectfully requested to acknowledge receipt of these formal drawings.

The submitted drawings are now all on the same size paper and are believed to obviate the informalities indicated on Form PTO-948 attached to the Office Action mailed June 3, 2003.

Respectfully submitted,

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Patent Attorney

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Gainesville, FL 32606-6669

JS/an

Attachments: 14 sheets of formal drawings

**DNA sequence:**

cccttcatgtcttttagaaaccccattatcttcttagggcccaattgaaaacccacatttcacctaacc
ccaaaggccgtgcacatgttgacgtgaacacccaaactaacacgtgtcatactgccagtggatgataaatgctcatacc
ataccagagtcatagatgtttttgggtggaaagatttgacggatgccttcatttcatttcaccaactccctccaa
cccaacaaaatgttatattagaaagccccaaagtgtaaacgaaagttataaatttcatttcattgtatcttacgt
attggaggaagatcaaatttcaatccccatttcattgtcaattgaagttctccg

[transit peptide start]

ATGGCGCAAGTTAGCAGAATCTGCAATGGTGTGCAGAACCCATCTCTTATCTCAATCTCTCGAAATCCAGTCACGCA
AATCTCCCTTATCGTTCTCTGAAGACGCAGCAGCATCCACGAGCTTATCGATTCGCTCGTGGGGATTGAAGAA
GAGTGGGATGACGTTAATTGGCTCTGAGCTTCGCTCTTAAGGTCAATGCTCTGTTCCACGGCGGAG

[mature peptide starts]

AAAGCGTGGAGATGTTACTTCAACCCATTAGAGAAATCTCCGGTCTTATTAAGCTTCTGGCTCCAAGTCTATCAA
ATCGGATCCTGCTTCTGCTCTGTCTGAGGTATATACACTTCGTTCTGCTCTGTAAATCTGAACCTAGATT
ATAAAAGATTGATACTTTACCATTTCGCTGTTGGTTTATAGGAACAACGTAGTGGACAACCTGTTGAATAGCGATGAC
ATCAATTACATGTTGATGCGTTGAAGAGATTGGACTTAATGTGAAACTGACAGTGAAATAATCGTGTAGTTG
AAGGATGTGGCGGGATATTCCAGCTTCAGATTCAAAGAGTGATATCGAACTTACCTCGGTAAATGCAGGAACAGC
AATGCGCCACTTTACCGCTGCGGTACTGCTGCAGGTGAAACGCAAGGTAGATTGAAGGAGTTGATGCTTCTGGTAT
TTGATGTTAAGGAATGGAGCTTGTGATGCTTATGATCCATTATTCCAGTTATGTGCTTGATGGGTGCCTCGT
ATGAGAGAAAGACCTATAGGGGATTGGTTGGTCTTAAGCAGCTTGGTGTGATGTTGAATGTAACCTTGGAACTA
ACTGCCCTCCTGTTGCTCAACGCTAATGGTGGCTTCCGGTGGAAAGGTTAGATCTTGCACAAATGGCATGTGAATAT
GTAATCTGTTCTTACTCTATGAAACACTTGCAGAAATGTTGATCATCATAGCTTAGCTTGACAAAGATTTCAGTTT
TAATCTACTCTCACCGATGGATCCTAAATAGAACATGGGTTATGTTGATGGTTCTGCTCGATTACCGTTTCGTT
GTATGTTCTGATTAACAATTAGGAGACATGTTGATGCTTGCATTGCAAGGTGAAGCTTCTGGATCAATTAGTAGTCAGTA
CTTGACTGCTCTGCTCATGTCGCTCCCTTAGCTCTGGAGACGTCGAGATTGAGATTGTCGATAAAATTAAATTCTGTT
CCATATGTTGAAATGACATTGAAGTTGATGGAACGTTCCGGGTTAGTGTGCGACAGTAGTGATAGCTGGGATCGTTCT
TTGTCAGGGCGGGAAAAATACAAGTAGGAGTTATTCTTTCTTCTGAAATCACATCCCTAGCTTGACAAAT
ATAATGACTAAAAGGTGAATGATTAGGTCTCCGGTAATGCGTATGTTAGAAGGTGATGCTCTAGTGACATGTTATTTC
TTGGCTGGTGTGCATTACCGGTGAAACTGTCACAGTCGAAGGTTGGAACCTACAGCTTGACAGGAAATATTGTCAC
ACTGAATCATGACCGAGGCTGTTAAGTTATAGTGAATTCTGCTAGGTCAAAGTTCATCTTGCACAGTTGACAAAGTTGAT
AACATATTGCAAGATTCTAAGCTCAATTGTTGATGAATCTCTAGGGAGATGTTAAATTGCGAGGTCTTGAGAA
AATGGGATGTAAGTGTCTGGACAGAGAACAGTGTGACTGTGACAGGACCCAGAGATGCTTTGGAAATGAGACAC
TTGCGGGCTATTGATGTCACATGAAACAAATGCTGATGTAGCCATGACCTTGCGCTGCTCTTGTGAC
GTCCAACCACCATTAGAGATGGTAAGTAAAAAGCTCTCTTATAATTAGGTTCTCAATATTGATGACTTAATT
CTGTTGGTTAATATAGTGGTAGCTGGAGAGTAAAGGAGACAGAAAGGATGATTGCCATTGACAGAGCTTAGAAAA
GTAAGAGATTCTTATCTCTCTTCTGTTGACAGTGTCTTCAAGTAATTAGCTCATAAATTGTTGTTG
TGTTCAAGCTGGGAGCTACAGTGGAGAAGGTTGAGATTATTGTTGATGAACTCCGCCCCAAAAGGTGAAAACGGCAGAG
ATTGATACATATGATGATCATAGAATGGCAATGGCATTCTCTTGTGAGCTTGCTGATGTTCCAATCACCAC
ACTCTGGTTGCACCAGGAAAACCTTCCCCGACTACTTCCAAGTACTTGAAAGAATCACAAAGCACTAAacaataaaactc
tgttttttcttctgatccaagtt

FIG. 1A

Title: Non-Transgenic Herbicide Resistant Plant

Inventor(s): Beetham *et al.*

Application No.: 09 685,403

Sheet 2 of 14



Protein sequence:

MAQVSRICNGVQNPSLISNLSSQRKSPLSVSLKTQQHPRAYPISSWGLKKGMTLIGSELRPLKVMSSVSTAE
KASEIVLQPIREISGLIKLPGSKSLSNRILLALAALSEGTTVDNLLNSDDINYMLDALKRLGLNVETDSENNRAVV
EGCGGIFPASIDSKSDIELYLGAGTAMRPLTAAVTAAGGNASYVLDGVPRMRERPIGDLVVLKQLGADVECTLG
TNCPVVRVNANGGLPGGVKLGSISSSQYLTLMSAPLALGDVEIEIVDKLISVPYVEMTLKLMERFGVSVEHSD
SWDRFFVKGGQKYKSPGNAYVEGDASSACYFLAGAAITGETVTVECGTTSLQGDVKFAEVLEKMGCKVWTENSV
TVTGPPRDAFGMRHLRAIDVNMMKMPDVAMTLAVVALFADGPTTIRDVASWRVKETERMIAICTELRKLGATVEEG
SDYCVITPPKKVKTAEIDTYDDHRMAMAFSLAACADVPIITINDSGCTRKTFPDYFQVLERITH

FIG. 1B

Arabidopsis thaliana wild type sequence:

Position	173 174 175 176 177 178 179 180 181 182 183
	L G N A G T A M R P L
	CTC GGT AAT GCA GGA ACA GCA ATG CGT CCA CTT

Arabidopsis thaliana mutant sequences:

Name	
A_{177}	CTC GGT AAT GCA GCA ACA GCA ATG CGT CCA CTT L G N A A T A M R P L
I_{178}	CTC GGT AAT GCA GGA ATA GCA ATG CGT CCA CTT L G N A I T A M R P L
$A_{177}I_{178}$	CTC GGT AAT GCA GCA ATA GCA ATG CGT CCA CTT L G N A A I A M R P L
$I_{178}S_{182}$	CTC GGT AAT GCA GGA ATA GCA ATG CGT TCA CTT L G N A G I A M R S L
$A_{177}S_{182}$	CTC GGT AAT GCA GCA ACA GCA ATG CGT TCA CTT L G N A A T A M R S L
$A_{177}I_{178}S_{182}$	CTC GGT AAT GCA GCA ATA GCA ATG CGT TCA CTT L G N A A I A M R S L
$V_{178}S_{182}$	CTC GGT AAT GCA GGA GTA GCA ATG CGT TCA CTT L G N A G V A M R S L
$L_{178}S_{182}$	CTC GGT AAT GCA GGA TTA GCA ATG CGT TCA CTT L G N A G L A M R S L
$A_{177}V_{178}$	CTC GGT AAT GCA GCA GTA GCA ATG CGT CCA CTT L G N A A V A M R P L
$A_{177}L_{178}$	CTC GGT AAT GCA GCA TTA GCA ATG CGT CCA CTT L G N A A L A M R P L

FIG. 2

SEP 08 2005

OIP

SEP 18 2003



Section 5

(285) 285 290 300 310 320 330 340 355

at<u>
b<u>
p<u>
<u>
ensu</u>

seq
A.seq
a.seq
A.seq
S.seq
ensu

(276) ATG TAT GCT CCG AAT GCG GAA TCA
CAT TGT GAT GTC TCT TAA TAA AAT CTT
GGT GAT GCT TCC CAA CGG AT CCA GTG
GCT GGC CCT GTC TAC GGG AT CTC AAT
TAT AGCT GCT GGCT CCA AA TCT CTC C
AAT CGG AT CCT CCA AA TCT CTC C
356

Section 6

(356) 356 370 380 390 400 410 426

at<u>
b<u>
p<u>
<u>
ensu</u>

seq
A.seq
a.seq
A.seq
S.seq
ensu

(347) ATG TAT GCT CCG AAT GCG GAA TCA
CAT TGT GAT GTC TCT TAA TAA AAT CTT
GGT GAT GCT TCC CAA CGG AT CCA GTG
GCT GGC CCT GTC TAC GGG AT CTC AAT
TAT AGCT GCT GGCT CCA AA TCT CTC C
AAT CGG AT CCT CCA AA TCT CTC C
356

Section 7

(427) 427 440 450 460 470 480 497

at<u>
b<u>
p<u>
<u>
ensu</u>

A.seq
a.seq
A.seq
S.seq
ensu

(418) ATG TAT GCT CCG AAT GCG GAA TCA
CAT TGT GAT GTC TCT TAA TAA AAT CTT
GGT GAT GCT TCC CAA CGG AT CCA GTG
GCT GGC CCT GTC TAC GGG AT CTC AAT
TAT AGCT GCT GGCT CCA AA TCT CTC C
AAT CGG AT CCT CCA AA TCT CTC C
356

Section 8

(498) 498 510 520 530 540 550 568

at<u>
b<u>
p<u>
<u>
ensu</u>

A.seq
a.seq
A.seq
S.seq
ensu

(489) ATG TAT GCT CCG AAT GCG GAA TCA
CAT TGT GAT GTC TCT TAA TAA AAT CTT
GGT GAT GCT TCC CAA CGG AT CCA GTG
GCT GGC CCT GTC TAC GGG AT CTC AAT
TAT AGCT GCT GGCT CCA AA TCT CTC C
AAT CGG AT CCT CCA AA TCT CTC C
356



- 1 -



SEP 08 2003

Section 17

(1137) 1137 1150 1160 1170 1180 1190 1207

peñal
bulto
ateler

seq (906) TAGCGTAACGTACGGCCCTGGAGGAAACACCTCAAGGGATGAGCA
SUS (1137) AGAAACAGTGTGACTGTGACAGGACCACCAAGAGATGCTTGGAAATGAGGCACTTGCGTGTGTTGATG

Section 18

(1208) 1208 1220 1230 1240 1250 1260 1270

pe a

Section 19

(1279) 1279 1290 1300 1310 1320 1330 1349

petra
tum

Section 20
S' seq (1048) AGAGA GTGGCTTC TGTGAGCTTGGCTAGCTGGAGT AAGGAGCAGAGATGTGGAGT ACCATCAGAGATGTGGAGT AAGGAGCAGAGATGTGGAGT S' (1279)

2010

As seen in Fig. 1, the variation of the current density with time is very similar for all three values of β , and the steady-state value is reached at approximately the same time.

part

.....nus (1350) GAAGCTTACGGCTACAGTTGAAAGGTTAGATTATTTGATTA
.....CTCGCCGGAGAAGGTGAAGGGGG



Section 1

(1) 1	10	20	30	40	50	60	70	74
ab <i>i</i>	CV	SVS	SPS	SPS	SPS	SPS	SPS	PLK
bne <i>F</i>	SRV	SRV	SRV	SRV	SRV	SRV	SRV	PLK
pla <i>a</i>	NNA	NNA	NNA	NNA	NNA	NNA	NNA	PLK
zme <i>p</i>	A	-	-	-	-	-	-	-
is	(1) MAQISRICNGVQNP	IISNLSKSQNQ	KSP	SVLKT	Q	PKASSWGLKKSGMLLIGSDIR	PLK	

Section 2

(75) 75	80	90	100	110	120	130	140	148
ab <i>i</i>	M	SVS						
bne <i>p</i>	SVS	SVS	SVS	SVS	SVS	SVS	SVS	SVS
pla <i>a</i>	SVS	SVS	SVS	SVS	SVS	SVS	SVS	SVS
zme <i>p</i>	-	-	-	-	-	-	-	-
is	(75) VASVSTAEKASEIVLOPIKEISGTIKLPGSKSLSNRILLAAalsegtivvdnl	N	D	I	L	G	L	N

Section 3

(149) 149	160	170	180	190	200	210	220	
ab <i>i</i>	ETDS	ETDS	ETDS	ETDS	ETDS	ETDS	ETDS	
bne <i>p</i>	ENAR	ENAR	ENAR	ENAR	ENAR	ENAR	ENAR	
pla <i>a</i>	VVE	VVE	VVE	VVE	VVE	VVE	VVE	
zme <i>p</i>	GGC	GGC	GGC	GGC	GGC	GGC	GGC	
is	(149) E DSANNRAVVEGGGIFPPVSIDSKSDIQFLGNAGTAMRPLTAAVTAAGGNASYVLDGVPRMRERPIGDLVVG							

Section 4

(223) 223	230	240	250	260	270	280	290	296
ab <i>i</i>	L	KOLGADY	C	R	R	R	R	
bne <i>p</i>	KOLGADY	C	R	R	R	R	R	
pla <i>a</i>	KOLGADY	C	R	R	R	R	R	
zme <i>p</i>	KOLGADY	C	R	R	R	R	R	
is	(223) LKOLGADVDCCTLGTTNCPPVRVNANGGLPGGKVLSGSISSSQYLTLMAAPLALGDVEIEIDKLISVPYVEMT							



Section 5

(297) 297 310 320 330 340 350 360 370

ate,
bneP;
petar;
zmeP;
(C.)

(298) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(299) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(300) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(301) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(302) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(303) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(304) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(305) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(306) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(307) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(308) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(309) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA
(310) L KLMEREGGK VV SVEHSDSWDRFFVKGGQKPKSPGNAYVEGGAAITGGTVTVEGGTSASSYFLAGA

Section 6

(371) 371 380 390 400 410 420 430 444

ate,
bneP;
petar;
zmeP;
(C.)

(364) EVLEKMGCKVSWTENSVTVTGPPTDAFGRKHLRAIDVNMMKMPDVAMTLAVVALFADGPTTIRDVASWRVKETE
(365) EVLEKMGCKVSWTENSVTVTGPPTDAFGRKHLRAIDVNMMKMPDVAMTLAVVALFADGPTTIRDVASWRVKETE
(366) EVLEKMGCKVSWTENSVTVTGPPTDAFGRKHLRAIDVNMMKMPDVAMTLAVVALFADGPTTIRDVASWRVKETE
(367) EVLEKMGCKVSWTENSVTVTGPPTDAFGRKHLRAIDVNMMKMPDVAMTLAVVALFADGPTTIRDVASWRVKETE
(368) EVLEKMGCKVSWTENSVTVTGPPTDAFGRKHLRAIDVNMMKMPDVAMTLAVVALFADGPTTIRDVASWRVKETE
(369) EVLEKMGCKVSWTENSVTVTGPPTDAFGRKHLRAIDVNMMKMPDVAMTLAVVALFADGPTTIRDVASWRVKETE
(370) EVLEKMGCKVSWTENSVTVTGPPTDAFGRKHLRAIDVNMMKMPDVAMTLAVVALFADGPTTIRDVASWRVKETE
(371) EVLEKMGCKVSWTENSVTVTGPPTDAFGRKHLRAIDVNMMKMPDVAMTLAVVALFADGPTTIRDVASWRVKETE

Section 7

(445) 445 450 460 470 480 490 500 518

ate,
bneP;
petar;
zmeP;
(C.)

(438) R MIAAICTELRLGATVEEGSDYCIIITPPPEKLNVTEIDTYDDHRMAMAFSLAACADVPTINDPGCTRKTFPDYF
(439) R MIAAICTELRLGATVEEGSDYCIIITPPPEKLNVTEIDTYDDHRMAMAFSLAACADVPTINDPGCTRKTFPDYF
(440) R MIAAICTELRLGATVEEGSDYCIIITPPPEKLNVTEIDTYDDHRMAMAFSLAACADVPTINDPGCTRKTFPDYF
(441) R MIAAICTELRLGATVEEGSDYCIIITPPPEKLNVTEIDTYDDHRMAMAFSLAACADVPTINDPGCTRKTFPDYF
(442) R MIAAICTELRLGATVEEGSDYCIIITPPPEKLNVTEIDTYDDHRMAMAFSLAACADVPTINDPGCTRKTFPDYF
(443) R MIAAICTELRLGATVEEGSDYCIIITPPPEKLNVTEIDTYDDHRMAMAFSLAACADVPTINDPGCTRKTFPDYF
(444) R MIAAICTELRLGATVEEGSDYCIIITPPPEKLNVTEIDTYDDHRMAMAFSLAACADVPTINDPGCTRKTFPDYF
(445) R MIAAICTELRLGATVEEGSDYCIIITPPPEKLNVTEIDTYDDHRMAMAFSLAACADVPTINDPGCTRKTFPDYF

Section 8

(519) 519 527

ate,
bneP;
petar;
zmeP;
(C.)

(512) THERIJKH
(508) VHEIJKH
(508) DVHQYJKH
(436) DVHSFVKH
(519) QVLESITH



Oligo Name Oligo Sequence (5' → 3')

ATEPS-A ₁₇₇	CGTTTCCAC <u>CTGCAGCAGTCAGTGACCGCAGCGGTAAGTGGACGCATTGCTGTTGCTGCATTACCGAG</u>
ATEPS-AI	CGTTTCCAC <u>CTGCAGCAGCAGTGACCGCAGCGGTAAGTGGACGCATTGCTATTGCTGCATTACCGAG</u>
ATEPS-IS	CGTTTCCAC <u>CTGCAGCAGCAGTGACCGCAGCGGTAAGTGAACGCATTGCTATTGCTGCATTACCGAG</u>
ATEPS-AS	CGTTTCCAC <u>CTGCAGCAGCAGTGACCGCAGCGGTAAGTGAACGCATTGCTGTTGCTGCATTACCGAG</u>
ATEPS-AIS	CGTTTCCAC <u>CTGCAGCAGCAGTGACCGCAGCGGTAAGTGAACGCATTGCTATTGCTGCATTACCGAG</u>
ATEPS-I ₁₇₇	CGTTTCCAC <u>CTGCAGCAGCAGTGACCGCAGCGGTAAGTGGACGCATTGCTGTTATTGCTGCATTACCGAG</u>
ATEPS-VS	CGTTTCCAC <u>CTGCAGCAGCAGTGACCGCAGCGGTAAGTGAACGCATTGCTACTCCTGCATTACCGAG</u>
ATEPS-LS	CGTTTCCAC <u>CTGCAGCAGCAGTGACCGCAGCGGTAAGTGAACGCATTGCTAATCCTGCATTACCGAG</u>
ATEPS-AV	CGTTTCCAC <u>CTGCAGCAGCAGTGACCGCAGCGGTAAGTGGACGCATTGCTACTGCTGCATTACCGAG</u>
ATEPS-AL	CGTTTCCAC <u>CTGCAGCAGCAGTGACCGCAGCGGTAAGTGGACGCATTGCTAATGCTGCATTACCGAG</u>

FIG. 5

Title: Non-Transgenic Herbicide Resistant Plant

Inventor(s) Beetham *et al.*

Application No. 09 685,403

Sheet 13 of 14

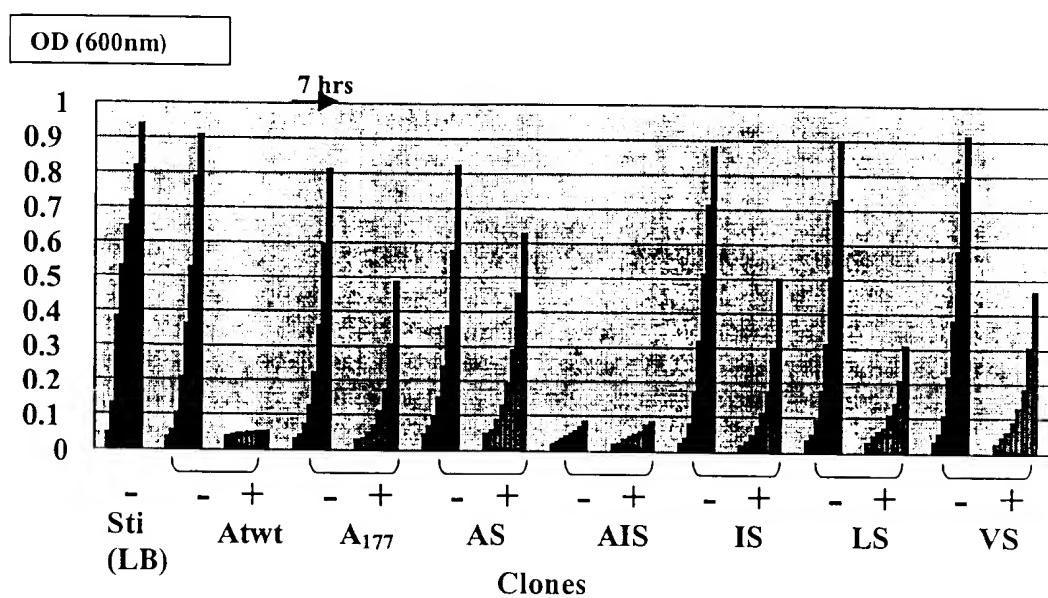


FIG. 6

Title: Non-Transgenic Herbicide Resistant Plant

Inventor(s): Beetham *et al.*

Application No.: 09 685,403

Sheet 14 of 14

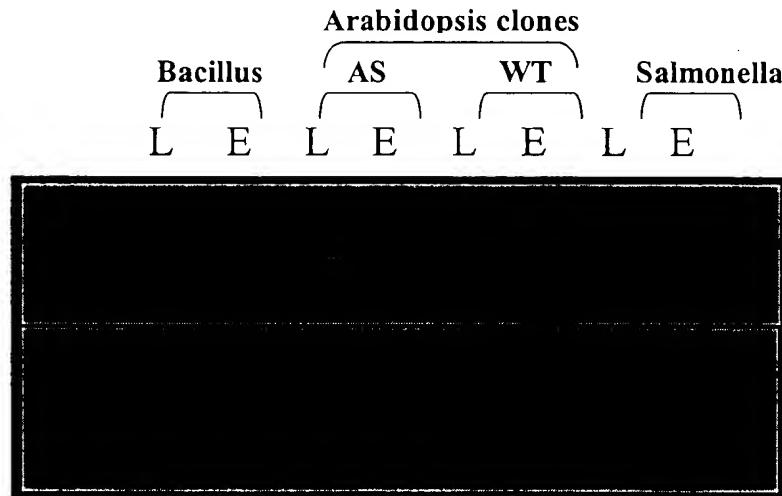


FIG. 7